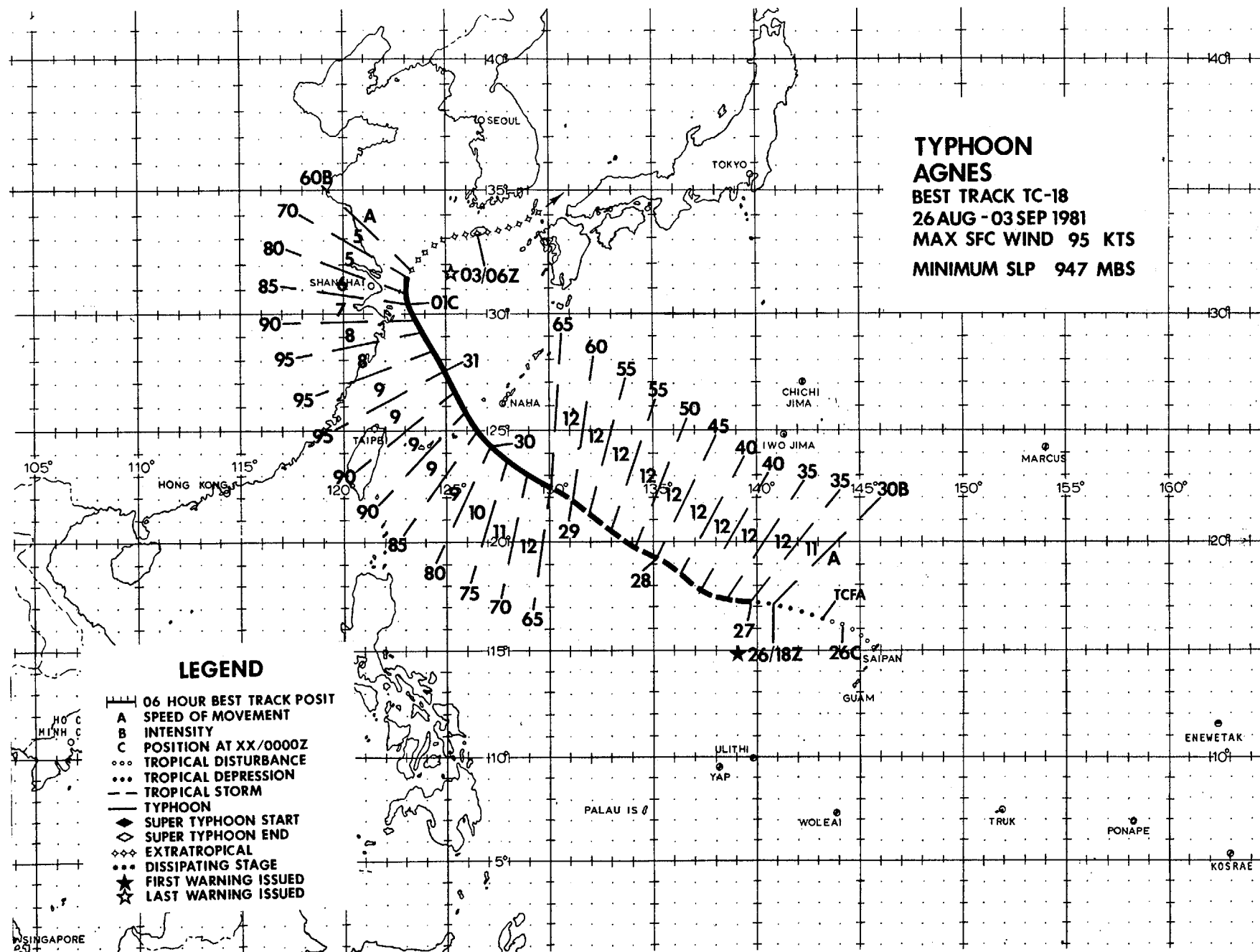


**TYPHOON
AGNES**
BEST TRACK TC-18
26 AUG - 03 SEP 1981
MAX SFC WIND 95 KTS
MINIMUM SLP 947 MBS



In mid-August, after several weeks of active cyclogenesis near Wake Island (WMO 91366) which spawned Tropical Storm Susan (14) and Vanessa (16), an upper-level ridge built over the latitudes north of the Marshall Islands and further activity was suppressed for several days. At 230000Z, satellite and upper-level wind reports showed evidence of an upper-level trough building westward from the dateline and during the next 36 hours, a well-defined Tropical Upper Tropospheric Trough (TUTT) cyclone developed in the vicinity of Wake Island. This upper cyclone induced an area of extensive, but yet unorganized, convection southwest of the TUTT cyclone. Gradually, as the convective area moved westward, a weak upper-level anticyclone became evident northeast of Guam. Concurrently, at 251200Z, the mid-tropos-

pheric winds reported from Guam became northerly, and 12 hours later, shifted to southeasterly as the system moved just north of Guam. On 26 August, while a reconnaissance aircraft conducted the initial investigation of the developing system, the 260000Z synoptic data indicated a possible low-level center approximately 150 nm (278 km) northwest of Guam. Based on these data, a Tropical Cyclone Formation Alert was issued at 260500Z and, at 260807Z, the investigating aircraft located a 1006 mb surface center 215 nm (398 km) northwest of Guam. During the subsequent period, satellite imagery showed improving convective organization and, at 261800Z, the first warning was issued for Tropical Depression 18. (Figure 3-18-1 shows TD-18 shortly after the first warning was issued).



Figure 3-18-1. Tropical Depression 18 at 262221Z AUG located 360 nm (667 km) west-northwest of Guam. This imagery shows a partially exposed low-level circulation on the north side of an extensive area of convection. (NOAA 6 visual imagery)

At 270600Z, TD-18 was upgraded to Tropical Storm Agnes when aircraft reconnaissance data showed a 994 mb sea level pressure at the center and measured winds of 46 kt (24 m/sec) at flight level (1500 ft (472 m)). The first three warnings on Agnes (TD-18) forecast a westward trajectory toward the Bashi Channel, south of Taiwan. However, by 271200Z, the analyses and numerical prognostic series indicated that the 500 mb ridge north of Agnes had not built, and would not build as far west as originally thought. Thus, the forecast track was changed to a more northwestward direction toward Okinawa.

While moving toward the west-northwest and intensifying along climatological norms, Agnes was upgraded to a typhoon on the 290000Z warning. At 300600Z, Agnes passed 90 nm (167 km) southwest of Okinawa and then began a turn toward the north along the western periphery of the subtropical ridge. (Figure 3-18-2 shows Agnes south of Okinawa with maximum winds of 85 kt (44 m/sec) and intensifying). At 310000Z, 170 nm (315 km) northwest of Okinawa, Agnes reached a peak intensity of 95 kt (49 m/sec) which was maintained for 12 hours then, after 311200Z, all available data indicated that Agnes had begun a weakening trend.

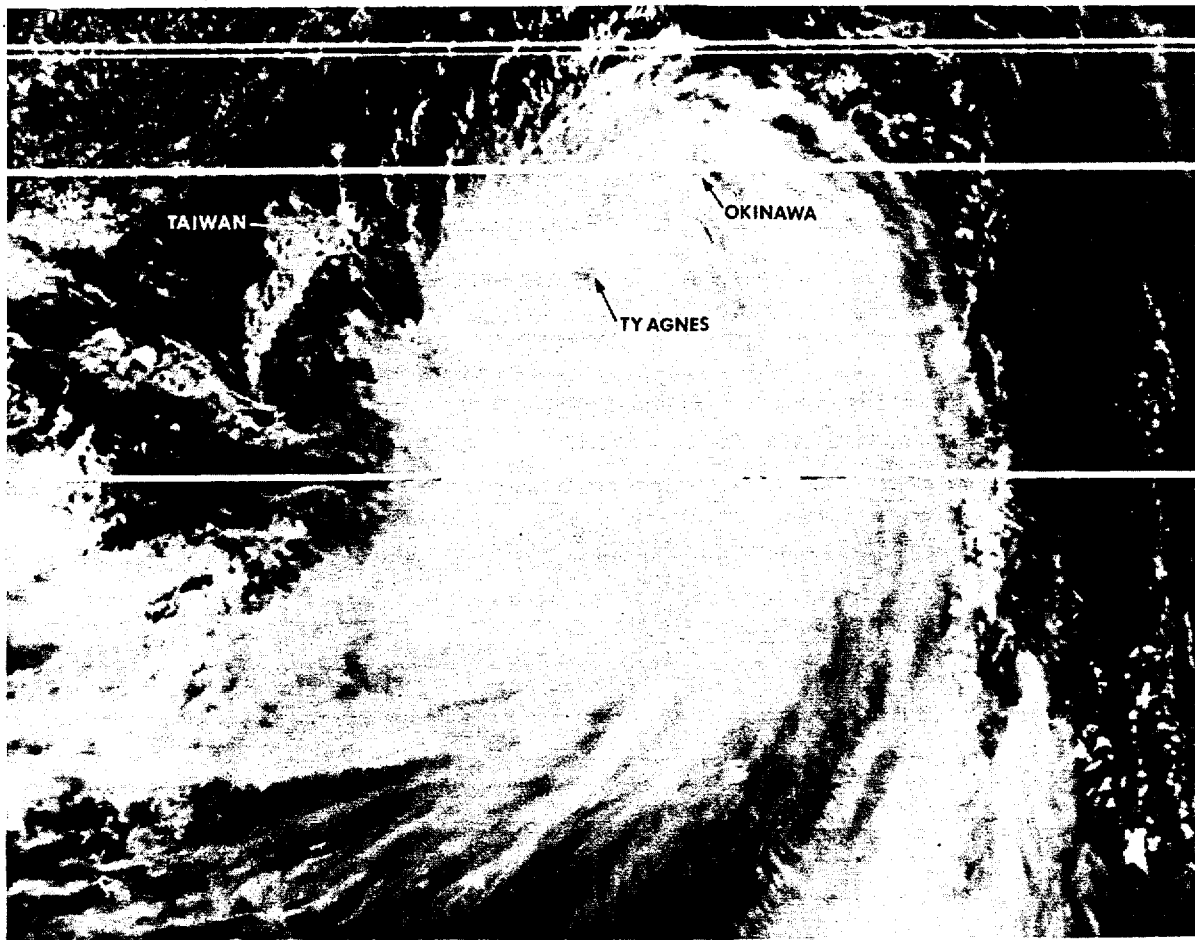


Figure 3-18-2. Typhoon Agnes (200548⁷ AUG), located just south of Okinawa, with maximum winds of 85 kt (44 m/sec) and approaching her maximum intensity of 95 kt (49 m/sec). Agnes had developed a large banding eye which later imagery and aircraft data would show as a much more compact central feature. (NOAA 7 visual imagery)

Prior to 020600Z September, the forecast scenario had anticipated Agnes would interact with a mid-latitude trough south of Korea and then accelerate northeastward. However, as Agnes moved north of 30N, there was no evidence of the anticipated acceleration; instead, there was increasing evidence that Agnes was losing much of her deep-layered convection and a premature extratropical transition was underway. (Figure 3-18-3 shows the 010000Z September 200 mb and 500 mb streamline pattern near Agnes). As Figure 3-18-3 indicates, there were significant opposing mid- and upper-level currents over Agnes and by 010900Z, satellite imagery showed the last evidence of an upper-level circulation pattern over Agnes. In post-analysis it was determined that Agnes had lost much of her tropical characteristics by 011800Z. However, since there were no aircraft or synoptic data close to Agnes to confirm this apparent transition, warnings were maintained until 030600Z at which time

synoptic data from Jeju-Do (WMO 47184) confirmed Agnes' character and that the threat as a significant tropical cyclone to Korea and Japan had passed. Although the system remained well south of Korea until 3 September, much of the southern portion of South Korea was being inundated with the heaviest recorded rainfalls in this century, up to 28 inches (approximately 71 cm). This adverse weather preceded the low-level center as the heavy rains and thunderstorms were sheared northeastward over Korea. Because most of the earlier forecasts had predicted Agnes moving over this region by this time, much of the potential damage from these rains may have been averted by the precautions taken well before the heavy rainfalls and flooding began. Finally, as a relatively weak wind system, the extratropical remains of Agnes passed through the Korea Straits and into the Sea of Japan on 3 and 4 September without any known reports of significant wind or sea damage in the region.

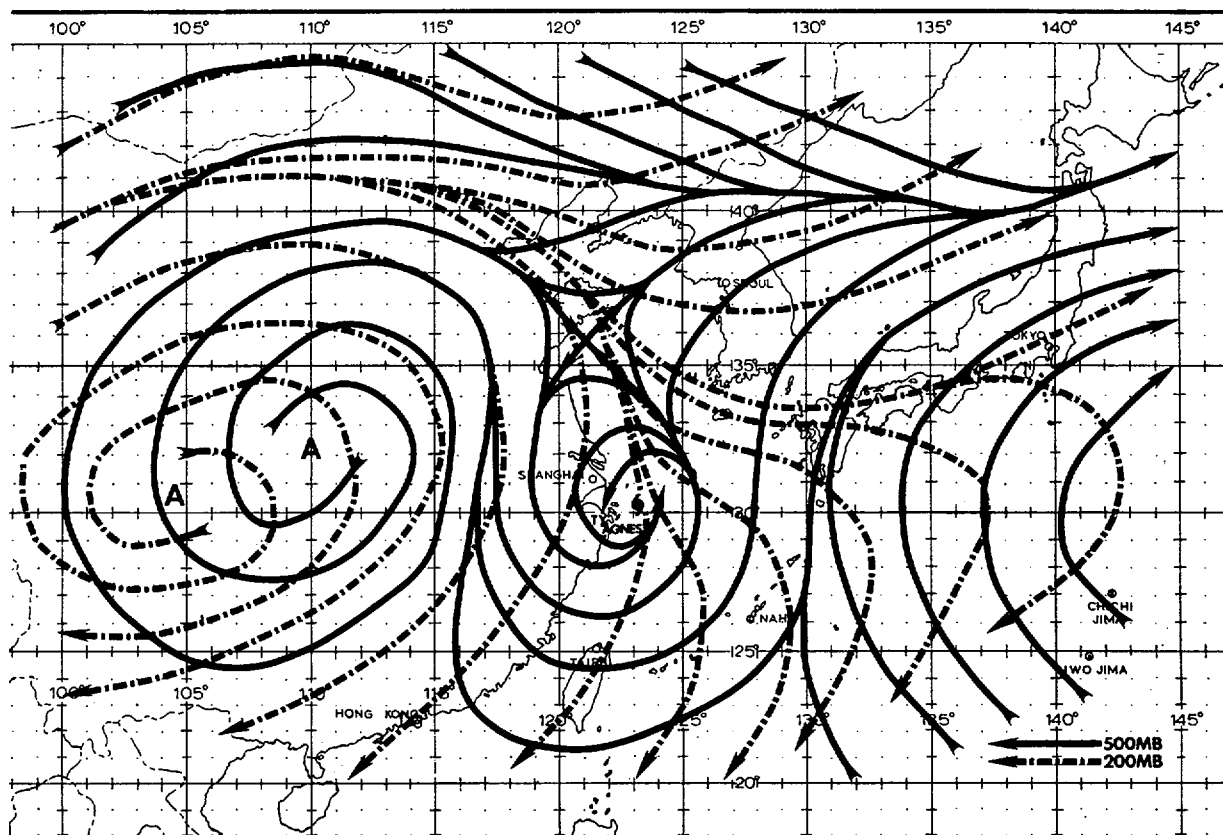


Figure 3-18-3. At 010000Z SEP, Typhoon Agnes was located near 30.2N 123.2E with maximum winds of 85 kt (44 m/sec). However, a strong 200 mb flow of 40 to 50 kt (21 to 31 m/sec) was evident over the 500 mb circulation. This pattern, already underway for 24 hours, continued for the next 36 hours during which Agnes lost her tropical characteristics and weakened to a weak extratropical cyclone.